

# The Emotion of Space

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Not too long after I became NASA Administrator I ran into a friend. She talked to me about the space program and took the opportunity to test me.

She asked, "Why do we spend money on space when there are so many ills here on Earth?"

Instead of describing the incredible scientific research we do or making the case for the investment we make in America's future, I said, "Come to a launch and you will understand."

I dispensed this advice based on my own experience. Prior to coming to NASA, I worked for a major space company, and for a time I was responsible for many of the Shuttle's large payloads. I was proud of my work. I could talk about the potential for discovery, the edge it gives our economy and how some projects were crucial for our nation's security. But, like my friend, I didn't truly grasp the significance of human space exploration. I rarely went to the Kennedy Space Center for launches and, somewhat selfishly, I only kept in touch by phone to learn of our spacecraft's release into orbit.

It wasn't until I started to make a point to watch the launches that I understood the emotion of space.

As the person who has ultimate responsibility for the safety of the astronauts, it was no longer a business proposition. Knowing the astronauts, knowing their families, all of us on the NASA team know we each must do our jobs right. In the dynamic moments before liftoff, we wish them a successful mission and a safe return home.

*We make it as safe as possible, but we also know that the men and women aboard that Space Shuttle are risking their lives to open the space frontier and to enhance life on Earth.*

Viewing a Space Shuttle launch is not an intellectual experience, rather it is an emotional one. And like most things in life, it cannot be fully appreciated through a lens or played back on a television screen. In the moments before launch there is always a tension I can never seem to adequately describe.

I don't watch launches from the control center partly because I want the members of the launch team to take full responsibility for their tasks and to remain accountable. Their jobs require split-second decision making skills. Conventional wisdom may call for

added layers of supervision in such a critical situation. In this case, however, delayed judgment could be the difference between success and failure.

For me, the place to watch is outside on the bleachers with friends, family, employees, fellow Americans and our foreign guests. Together, we share one of the most awesome displays of sheer power as the astronauts are catapulted to space.

As the launch time approaches more and more people arrive. The viewing site becomes a beehive of activity. Cameras start whirring. Conversations grow louder. The combination of sounds drown out the pre-launch commentary.

It isn't until built-in hold occurs at about T-minus nine minutes and a call from launch control declares all systems are go that there is a shift in the crowd's mood. There is brief applause. But, as the countdown resumes, so does the chatter and movement.

Shortly after, the Star Spangled Banner begins to play over the loudspeaker and for the first time the crowd seems to appreciate the weight of the moment. Some people are singing, some are saluting and some are praying silently. The Space Shuttle and the launch tower appear to be standing at military attention. The words to the National Anthem play through your mind like they have a thousand times before. But this time, at "the home of the brave," a giant lump has formed in your throat and a mist has glazed your eyes.

As the countdown clock ticks away, you cannot help but think that people are sitting atop 4.5 million pounds of high-energy fuels and complex aerospace machinery. Subconsciously, it becomes a life and death experience. First your breathing slows, then your heartbeat becomes noticeable and then an uncomfortable muscle tension fills your body. You don't want to talk with anyone and your eyes are fixed on the Shuttle. You begin listening intently to the words of the launch commentary to try and pick up any nuances. *Are there any problems?*

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As you watch from three miles away, you try to imagine what must be going through each astronaut's mind in the moments before liftoff. *My adrenaline is flowing and I'm not one of the people that's about to go 17,500 miles per hour to space.* Just fifteen minutes ago you were part of a crowd and now, you might as well be alone as you stand among thousands of others who do the same amid the silence.

"T minus 10 - 9 - 8 - . . ." *It feels like an eternity. Is it just me?* "7 - 6 - . . ."

*The engines are lighting and we haven't even reached T-minus 1 yet, what's*

*going on? "5 - 4 - 3 - . . ." Wait, flames are pouring out and the Shuttle just moved back and forth in the tower. Is something wrong? "2 - 1 - Liftoff of the Space Shuttle . . ."*

Slowly, as if in time-lapse photography, the Shuttle climbs upward. At first, it seems surreal as the massive spaceship appears to hover at the tower, yet it is still eerily quiet. Still in a dreamlike state, you see huge clouds of smoke and then a light from the rocket's engine that seems nearly as bright as the Sun. Out of nowhere a rumbling shockwave comes across the water and the sound reaches your chest and shakes you back to reality. It seems like the soundman has realized he forgot to connect the speakers when an unnatural thundering crackle from the Shuttle's engines reaches alarming levels. *What's that sound? Is that supposed to happen?*

In just a few seconds any doubts that the rocket is powerful enough are dispelled. Once those twin solid rockets are lit, at T-zero, there is no turning them off. Then at 40 seconds, to ensure the vehicle's pressure limitations are not exceeded, the three main engines are throttled down to idle. *Straight up, faster than the speed of sound.*

At 70 seconds, the astronauts get a command from mission control to urge the beast back to full-throttle. A knot forms in your gut and all ears are honed in on the launch commentator as he calls the order, "Go at throttle up." *Challenger passes through my mind.* Another few seconds slowly drip by until the commander calls back and says, "We're go at full throttle."

Two minutes and five seconds -- at nearly five times the speed of sound, the expended solid rocket engines are jettisoned and parachute into the ocean. Another call to the astronauts is made: "Performance nominal."

The almost insignificant term is the astronauts' signal that the first stage of their journey to space is safely behind them. *I heave a sigh of relief and the weight begins to lift from my shoulders.* A light streaks higher and higher, leaving a graceful white trail in its wake.

As the engines' sounds fades away, we all try to follow the astronauts' path. Soon, they have disappeared into orbit. But it isn't until eight and a half minutes later when the engine's explosive hydrogen and liquid oxygen fuels are depleted that we hear the call for main engine cut-off. Our astronauts have climbed safely to orbit. *Thank God.* We take our first real breath since liftoff and then let out a big cheer.

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I ran into my friend at a speech shortly after she saw her first launch. She said, "Dan, I have to talk to you." I said, "I'm about to deliver a speech. Can we talk later?" "No," she

said, "I have to tell you that I went to see the Space Shuttle launch. I realized that there were three million things that could go wrong, but they didn't. I understand and I cried."

*She got it.*

Yes, NASA has cool robots that rove other planets and cutting-edge telescopes that peer into other galaxies, but the heart and soul of NASA are our astronauts. They are the role models on which children pin their hopes and dreams. They connect us with our ancestors, those who founded this great country and bravely explored the next unknown horizon. And they help us understand that we are only human.

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